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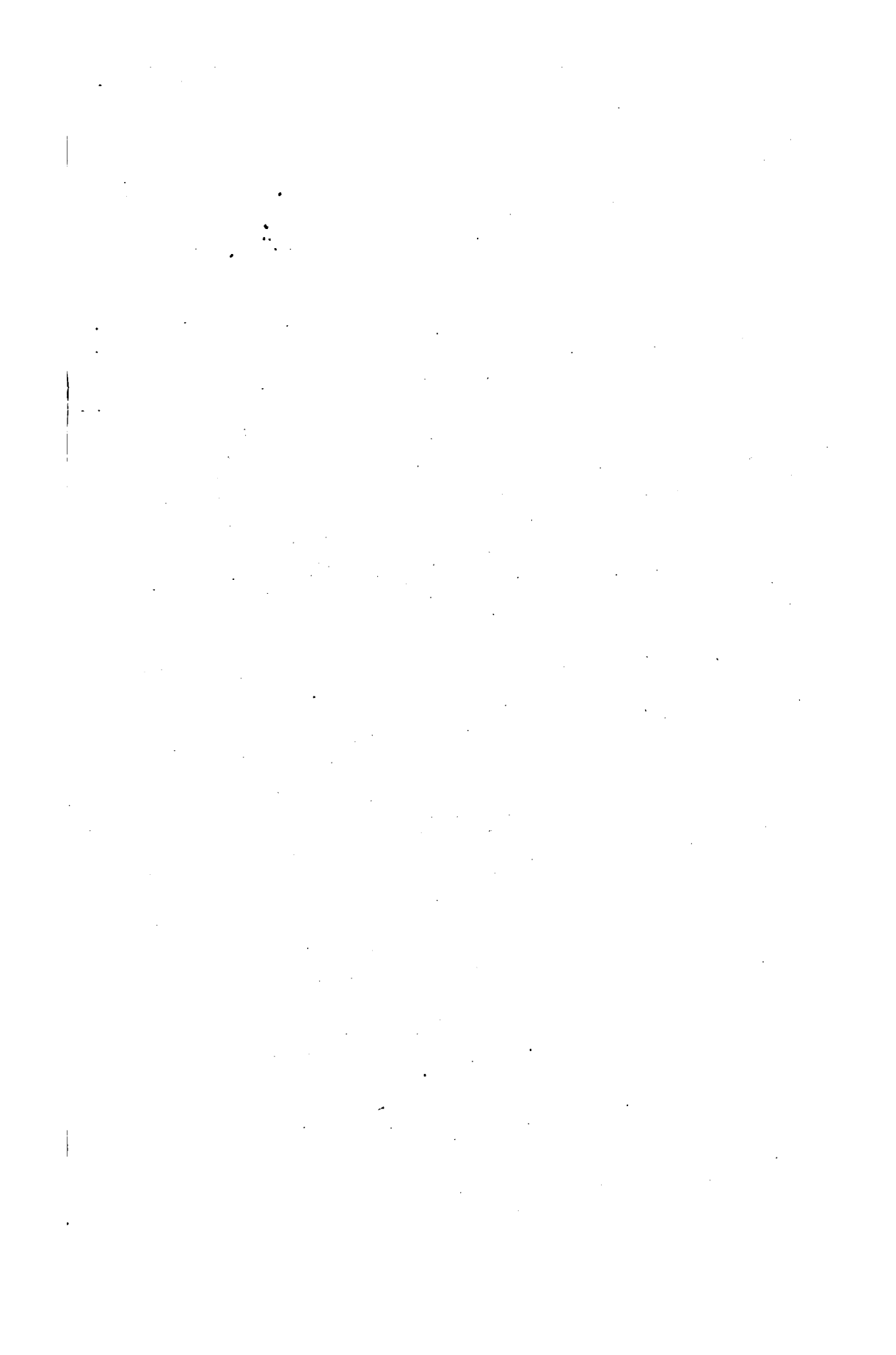
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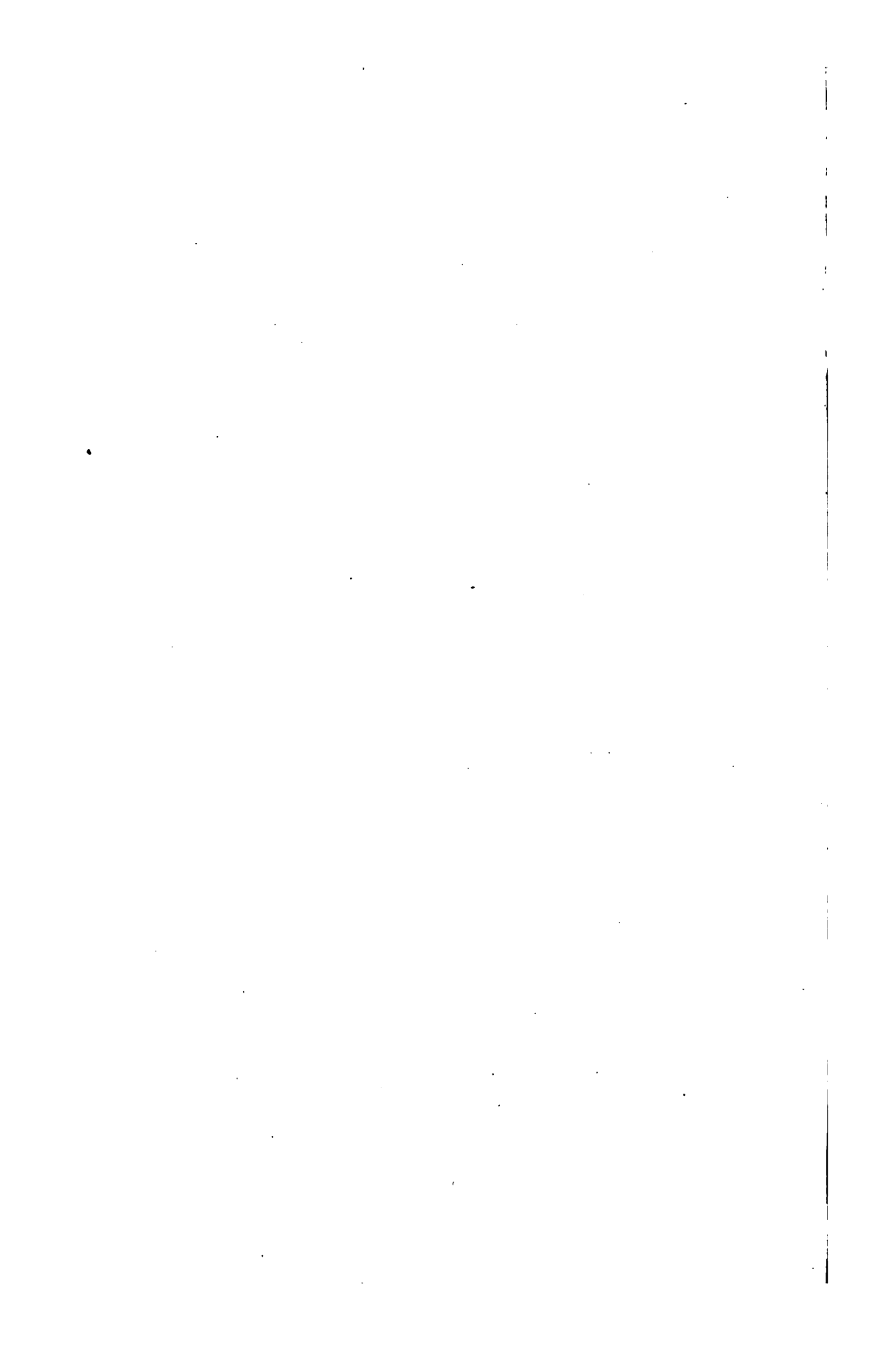
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ON THE
CEREBRAL AFFECTIONS
— OF —
CHILDREN.

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AN ESSAY ON THE CEREBRAL AFFECTIONS

OCCURRING MOST COMMONLY IN

INFANCY AND CHILDHOOD.

A N E S S A Y
ON THE
CEREBRAL AFFECTIONS

OCCURRING MOST COMMONLY IN
INFANCY AND CHILDHOOD :

INCLUDING NOTICES OF
THEIR HISTORY, CAUSES, DIAGNOSIS, PROGNOSIS, AND
TREATMENT :

BEING THE COUNCIL PRIZE ESSAY, AWARDED AT THE ANNUAL MEETING
OF THE PROVINCIAL MEDICAL AND SURGICAL ASSOCIATION, HELD AT
BATH, ON WEDNESDAY AND THURSDAY, AUGUST 16TH AND 17TH, 1848.

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AN ESSAY.

FEW diseases which engage the attention of the physician are more interesting in their nature, or important in their results, than the cerebral affections of infancy and childhood ; whether we regard the tender age and helpless condition of the sufferers, the extreme anxiety which is felt by parents, when those so dear are afflicted by what must ever be considered dangerous maladies, or the mighty interests that are at stake,—the inestimable blessing of sound reason and its enjoyment so frequently depending upon the issue.

In another point of view also, they are a class of diseases claiming the closest attention of the physician ; both from the frequency of their occurrence, and in so far as his own reputation is concerned. Diagnosis, in these cases, is frequently very difficult, and is often still further obscured by the impossibility of obtaining any information to assist us from the little patients themselves. Hence

the necessity for great tact and practical familiarity with all the phases under which the attack may be made, to facilitate the recognition of their nature at an early period, when alone our art may be made available effectually to combat them. Some of these affections are so very acute in their progress, and disorganization of the delicate structures engaged takes place so rapidly, that unless the way is clearly seen, and the course of treatment promptly adopted and vigorously carried out, our very best efforts are unavailing. Hesitation and uncertainty may occasion the loss of a patient; mistakes may be fatal, and, especially in the cases of children, are never forgotten.

Notwithstanding all that has been written upon the subject, and the clear manner in which the differential diagnosis has been attempted to be established, the practical physician will admit the great difficulty he sometimes experiences in pronouncing upon the nature of the case. We are frequently not called in, until the time has passed when the early observation of symptoms might have afforded greater facilities for drawing inferences. Unfortunately it often happens, too, that cerebral affections are so insidious in their approach, so masked by some prominent, remote, sympathetic affection, or so little characterized by any very decided pathognomonic symptoms, that they are overlooked by the friends in the early stages; and

the doctor is called in, only in time to confirm the apprehension that has been accidentally excited for the safety of the head. The child may have been astray for some time, and have lost flesh,—but it was only teething, and has often been so before. True, it has had vomiting, but then the food disagreed ; or if it be an infant suckling, the mother has been anxious, and has lost her rest—enough to cause that. There is a ready and familiar way to account for every symptom, but the lurking disease is overlooked, or not suspected. The supervention of convulsions, screaming, severe head-ache, or perhaps sudden coma, arouses anxiety, and directs attention to the head, and then, too often, irremediable mischief has been done.

Medical literature has furnished many treatises upon the affections of the head in infancy. Some are voluminous, embracing every disease ; some are valuable monographs ; many are inaccessible to the ordinary student from their scarcity, and some from being published in a language with which he is not acquainted. My endeavour, in the following pages, will not be to furnish a perfect encyclopædic history of these diseases, but rather a concise account of those occurring most frequently, with extracts from the most valuable works to which I have had access ; introducing such practical observations, especially upon diagnosis and treatment, as a considerable experience in, and fa-

miliarity with, the diseases of children, enable me to offer. As the practical utility of the treatise is chiefly aimed at, I shall excuse myself for not following strictly any author's classification, but shall adopt, in each instance, that which seems most likely to convey the clearest views of the particular disease under consideration, that which is truest to nature, and appears best marked, by some strong, easily recognized, and generally occurring characteristic.

From the very early medical history of cerebral affections in infancy and childhood, we do not gather much information that is valuable. There existed, even until the middle of the last century, great obscurity as to the diagnosis, complete ignorance of the pathology, and doubt and despondence about the treatment. Until the work of Dr. Whytt was published in Edinburgh, the matter does not seem to have received really scientific attention; but his views of the subject possessing considerable novelty, aroused other authors, and we soon find Drs. Fothergill, Watson, Dobson, &c. in the field of publication. Afterwards, and at about the same period, 1791, Drs. Rush of Philadelphia, and Quin of Dublin, devoted attention to this subject, and by propounding new and more correct views of the nature of hydrocephalus, added much to the knowledge that was possessed. These authors were followed by the late Dr. Cheyne of Dublin,

who treated of the same disease in two very able essays, which still form a text-book, and retain a deservedly high character.

Among our continental brethren, too, much has been done. Gölis's treatise, so well known, is very complete and valuable, and from the works of MM. Rilliet, Guersent, &c. we derive much useful information, pathological as well as practical.

To modern English authors, also, this department of practical medicine is very much indebted ; and from the lectures of Drs. West and Willshire, and the publications of Dr. Marshall Hall, I have derived much information. To several others, also, from whom I have received hints, or from whom I may have quoted passages, I beg to make my acknowledgments.

Clearness of style, distinctness of expression, and a facility of conveying to the reader the author's views upon a subject, are amongst the recommendations in such an essay as this ; and being so convinced, I have aimed at rendering this treatise useful, and easily understood and remembered, rather than making it appear learned or laboured, by the introduction of numerous quotations, or the use of a greater number of new or technical terms than is necessary for the proper description of each disease.

CONGESTION OF THE BRAIN.

We shall commence the account of cerebral affections in infancy by noticing the occurrence of congestion of the brain, which sometimes is present at or occurs immediately after birth. This is rather a rare occurrence, and we more frequently meet with the affection at a later period of life. It arises from several causes,—as a neglected state of the bowels, exposure to cold, an impediment to the return of blood from the head, &c. I have known it to occur and prove fatal in twenty-four hours, from sudden passion in a nurse ; and there are strong grounds for believing that the free use of spirituous and fermented liquors, by suckling mothers, has frequently induced it. It is liable to occur also during the course of the exanthemata and hooping cough ; the latter, in my experience, having been a most fruitful source of it.

“When suffering from congestion, the child will be stupid and heavy, the head looking full, and being perhaps hotter than usual, the veins distended and dark coloured, the countenance livid, and the pulse slow or irregular ; the pupils are usually dilated, and the eyes looking vacant ; a permanently elevated and convex condition of the fontanelles leaves no doubt of its existence.” (*Maunsell and Evanson.*) If unrelieved, these symptoms may be

followed by effusion, and death take place in twenty-four hours.

The treatment must consist in removing the cause, if we have control over it, and next in relieving symptoms. Cold applications to the head, with perhaps the general warm bath, and freely acting on the bowels, will generally be sufficient ; but if the lividity of countenance, or the nature of the breathing denote danger, we must apply leeches. Blisters will also be found useful, and both these remedies are recommended to be applied to the extremities rather than the head. I should select the nape of the neck as the part best suited for blistering. Tonics and stimulants may be necessary to prevent a recurrence of the symptoms of congestion.

IRRITATION, OR ERETHISM OF THE BRAIN.

Morbid irritation, or erethism of the brain, is also sometimes met with amongst infants, especially in large cities. It is characterized by an increased irritability of the sensorium, and susceptibility to impressions ; noise and light are equally disagreeable, and the child is uneasy and fretful. The eyelids are generally closed, and the flexion of the thumb on the palm of the hand, so well known to nurses, is constantly observed. The child is generally very watchful, and gets little sleep.

There is not any complaint of pain in the head, nor is there increased frequency of pulse, or heat of skin.

This affection is generally attendant upon dentition in delicate children, and may arise in them from every debilitating cause. I have seen it occur after remittent fever, long protracted ; and also after diarrhœa. If this state of morbid irritation should exist long, hydrocephalus might be induced. Congestion of the brain, which we have already spoken of, and the hydrencephaloid disease, to be hereafter described, have many symptoms in common with erethism. The watchfulness and extreme sensibility in this case will contrast with the stupor and tendency to coma in the former. Our principal efforts must be directed to allay irritability, and procure sleep : we must also be careful to support the strength, by light nourishment ; but stimulants, as wine, must be avoided. The bowels must be evacuated by enemata and mild aperients ; cold also should be assiduously applied to the head, and warm stupes to the feet ; a very nice method of applying the latter is by means of flannel wrung out of hot water, rolled round the legs and feet, this again being wrapped up in a warm, dry piece of flannel, or small blanket. I have frequently known this procure sleep, in many of the affections of childhood, and it has the recommendation of disturbing the child very

little, and is applicable in cases where the fatigue of a general warm bath would be too great. Nothing will sooner relieve our patient, and assist the means we prescribe, than change of air. It really acts sometimes magically, as all who have seen much of the diseases of children can vouch. Sometimes it may be necessary to have recourse to the use of opium, which, if cautiously and prudently administered, will prove a useful assistant in breaking the habit of wakefulness, and procuring sleep.

THE HYDRENCEPHALOID DISEASE.

The hydrencephaloid disease was first particularly described by Dr. Marshall Hall. "This affection," he says, in his admirable essay on the subject, "may be divided into two stages; the first that of irritability, the second that of torpor. In the former, there appears to be a feeble attempt at reaction; in the latter, the powers appear to be more prostrate. These two stages resemble, in many of their symptoms, the first and second stages of hydrocephalus respectively."

It is very necessary to be thoroughly acquainted with the circumstances under which this disease is likely to occur; for the symptoms are not peculiar to it, but may occur in other affections requiring a very different treatment; to wit, in hydrocephalus and in morbid irritability of the brain. If we

trace the history of the case, we shall generally find that there has been some considerable evacuation, either loss of blood in the cure of some other affection, or long existing diarrhœa. The infant at first is irritable and peevish ; he starts upon being touched, and is over-sensitive. There is sighing and moaning during sleep, and sometimes screaming. Here are symptoms, some of which are present in the erethism of the brain, and some in hydrocephalus ; and it will require the closest attention to the history of the case, to enable us to discriminate between them. As the disease advances, the exhaustion is more apparent ; the countenance becomes pale, and the cheeks cool ; the eyelids are half closed, the eyes fixed, and unattracted by any object placed before them ; the pupils unmoved by light ; vomiting is sometimes present, and the bowels are rather free than constipated, though the evacuations are unhealthy. You must meet these symptoms by supporting the system, administering gentle stimulants, and such moderate doses of opium as may allay irritability, or check diarrhœa, if present. Dover's powder is a very manageable form in which to use this medicine, and the starch enema, with opium, will be generally effectual when diarrhœa exists. If vomiting be present, we must try to allay it by administering small quantities of nourishment, as chicken-broth ; or if the exhaustion be very great,

by stimulants, as wine, or even brandy. A small blister for an hour, over the stomach, will often materially assist in checking vomiting. If there be great coldness of the surface, we may use the warm bath for a short time ; and the water may be made stimulating by the addition of some mustard. After the symptoms have been subdued, tonics must be administered to prevent relapse, and, as before mentioned, change of air is most desirable. Should we, by oversight or mistake of its real character, treat this disease by continued depletion, our patient would assuredly sink rapidly, and die comatose, or convulsed.

The application of cold to the head, so useful in most of the cerebral affections of infancy, would here be badly borne.

Should the symptoms not be relieved, the child may die seemingly exhausted, and examination would very likely show considerable serous effusion in the ventricles ; but then this would have been more of a passive nature than the result of acute inflammation.

Symptoms of exhaustion are frequently seen in children who are imperfectly nourished, either on account of deficient supply, or the bad quality of the nurse's milk. These matters must be closely inquired into by the physician, and his treatment regulated accordingly. The change of a nurse,

under such circumstances, is imperatively called for.

Great attention should also be paid to the nourishment a child receives after being weaned, especially if that process has been suddenly carried into effect from any necessary cause. The assimilating powers of the digestive apparatus are weak, and disease of the brain may result from deficient nutriment.

CONVULSIONS.

Disturbance of the nervous system in children, whether functional or organic, more constantly declares itself by the occurrence of involuntary muscular movements, than by the complete loss of motor power in any part.

Every one is aware of the frequent occurrence of convulsions in early life, and the apparently trifling causes from which they often seem to arise. Delicate children are more liable to them than those who are more robust, while the danger to be apprehended is greater in the latter. Perfect paralysis of a limb will also occasionally occur in a child, and, though always a source of considerable anxiety, and occasionally incurable, is not so indicative of deep seated disease as when we meet with it in an adult.

If paralysis in a child resists treatment, and

remains permanent, we may reasonably conclude that it depends upon some organic affection.

Convulsions are so very well known, both to the medical man and to all mothers, that a minute description of them here would be superfluous.

Every portion of the muscular system, voluntary and involuntary, may partake of the morbid action. The attack may be very severe, of long continuance, and often repeated ; or there may be but slight spasmodic twitchings in a few muscles, as those of the face and hands. The danger to be apprehended arises more from their persistence and repetition, than from the apparent severity of the attack.

The causes of convulsions are very various ; every affection of the brain and nervous system seems liable to be accompanied by them. It is mentioned, indeed, by Dr. West, "that convulsions in infancy and childhood seem to take the place of delirium in adult life." We meet with them in every lesion of the brain, functional or organic, and proceeding from very opposite states of that organ: in congestion, morbid irritation, and the later stage of the hydrencephaloid disease, as well as in acute and tubercular meningitis. All inflammatory affections in children are liable to cause, or be attended by, convulsions. Pneumonia, more particularly, is often thus ushered in, and spasm of the glottis is constantly accompanied by

them. The natural process of teething is a frequent exciting cause ; and more remote sympathetic irritation also gives rise to them, such as that caused by worms, flatulence, and indigestion. Mental impressions, as excessive fright, will also occasion convulsions.

The treatment must depend mainly upon the removal of the cause of the attack. The discovery of this is very often a difficult matter, but we shall generally proceed safely in ordering cooling applications to the head, having the bowels well freed, and directing the use of the tepid or warm bath ; sprinkling cold water in the face is a means also recommended ; I have seen it shorten and prevent the seizure. When some distinctive symptoms are present, localizing the cause, we can apply ourselves more particularly to their removal. Carminatives, with turpentine and assafoetida enemata, will procure the discharge of flatus, generally followed by great relief.

Lancing the gums should never be neglected ; it will often induce sound sleep, and hinder a return of the attack. Sometimes, especially where there is a tendency to somnolence or coma after the seizure, the application of a couple of leeches will considerably lessen the liability to a recurrence. In such a case, we must be very cautious in the use of cold to the head. We must not attempt to shorten the attacks by the administration of

opium, or too frequent use of antispasmodics ; but aim rather at removal of the cause. In cases of morbid irritation, and sometimes also in the hydrocephaloid disease, we do use opium and stimulants with advantage. The termination must always depend upon the cause, and on success in its removal. The danger of a fatal termination is not greatest in the most delicate children. The long continuance of convulsions may give rise to very serious injury of the sensorium. When they resist treatment, and recur constantly, always order change of air ; and very likely, in such cases, tonics may be necessary.

ACUTE MENINGITIS.

Amongst the most rapidly fatal of the diseases of the brain in children, is acute inflammation of that organ and its membranes. Fortunately, it is a disease of comparative rarity in this country, and some authors still describe it as only a variety of hydrocephalus. There are very abundant reasons, however, for considering it as a distinct affection, as its causes, course, and termination fully testify.

Unlike the tubercular meningitis, to be described hereafter, this affection usually attacks strong and previously healthy children, and in a very sudden manner. It is generally so acute, and accompanied by such severe symptoms, that it is not long overlooked, but very soon comes under medical care ;

but unfortunately, though early recognized, it is not as amenable to treatment as acute inflammations elsewhere, or even as the same disease is in advanced life. This may be accounted for in part, by considering the very rapid growth of the brain in infancy, and the abundant manner in which it is supplied with blood.

The causes which most frequently give rise to this affection are, exposure for a lengthened period to the sun's rays; injuries received, as direct blows, and wounds penetrating the orbit and other parts of the cranium; dentition at both periods. It is sometimes epidemic, and occasionally occurs without any assignable cause. It accompanies or follows other diseases, as the exanthemata, and has, in some cases which came under my own observation, been connected with sudden suppression of purulent discharge from the ear. It is sometimes caused by the repercussion of cutaneous affections of the scalp. Often, however, the closest attention cannot discover any cause sufficient to account for the attack.

The infant daughter of an esteemed medical friend has recently been the subject of a very severe attack of acute meningitis, the accession of which was sudden, and could not be traced to any cause; and, but for the very active treatment promptly adopted, it would most likely have proved fatal within twenty-fours. In this case also,

there seemed to have been an extension of the inflammation to the spinal cord ; for there was considerable rigidity of the lower limbs, and inability to use them for a long time, after all other symptoms had disappeared. I have more than once seen the cerebral symptoms which occasionally precede an attack of small-pox, give rise to decided meningitis.

Attacks of otitis are by no means rare, or of uncommon occurrence in infants. The symptoms closely simulate those of meningitis, and may, no doubt, if unrelieved, lead to the graver disorder.

Phlebitis of the sinuses of the dura mater, a disease very rarely met with, may give rise to general inflammation of the brain and membranes.

Symptoms of Acute Meningitis.—Authors divide this disease into the phrenitic and convulsive forms, according as the intellectual faculties may be primarily and particularly engaged, or as convulsions may occur early in, or characterize the attack. In the phrenitic form, however, convulsions are not wholly absent, neither does the intellect escape entirely in the convulsive. The former, as might be expected, occurs more frequently in children of four years old and upwards, who have begun to exercise actively their reasoning powers ; the latter, in younger infants. The convulsive form usually commences suddenly, by an attack of convulsions,

general or partial. There is febrile disturbance, but not so great as in the phrenitic variety; vomiting and constipation are not so usually observed. The convulsions are repeated at short intervals, and between times the child remains either very much agitated or comatose, with the pupils mostly contracted, and very likely there is squinting; sometimes we have hemiplegia.

In the phrenitic form there is generally a rigor, followed by fever and vomiting, with head-ache, intolerance of light and noise, quick pulse, hot and burning skin; the child is very restless, and answers questions abruptly and peevishly. The intellect becomes soon engaged, and, as the disease advances, the symptoms indicative of derangement of the nervous system become more marked; the head-ache is intense, with frowning; delirium, of a violent character, is present, alternating with stupor. Convulsions now occur, and there is strabismus, with contracted pupil. The child lies with his eyes closed, and face averted from the light; he often starts and screams with the violent pain, which is so severe as quite to deprive him of sleep. The respiration and circulation are also much affected; the former is hurried and irregular, presenting that character so well known in fever as cerebral breathing. The pulse is very quick, and generally strong and full, but variable. The face is alternately flushed and pale, with an aspect at times

wild ; at others, expressive of great suffering. The skin is burning hot and dry. The digestive system also sympathizes. The tongue is red and dry, vomiting of bilious matter incessant, and the thirst urgent. The excretions from the bowels are scanty, and the urine high-coloured and diminished in quantity. If the disease be not arrested by treatment, the convulsions become more frequent and severe, with grinding of the teeth, strabismus, dilated pupil and coma ; where it is protracted, hemiplegia is sometimes present, and occasionally spasms of the muscles of the arms and legs ; these latter more particularly when there has been an extension of the diseased action to the spine.

Diagnosis.—When we come to make the diagnosis of this disease, we must recollect that many of the most prominent symptoms indicate other affections of the cerebrum as well ; and accordingly, we must be guarded in pronouncing upon the nature of the case, and carefully draw our inferences from the history of the attack, and a consideration of the entire of the symptoms. The child is often very young, and can only make us acquainted with its feelings and sufferings by gestures. The age and appearance of the patient, the probable cause, the mode of attack, and the intensity of symptoms, must be closely inquired about ; the former, because we know that this affection is most fre-

quently met with during the periods of dentition, primary and secondary, and because it most constantly attacks strong, healthy children, who have not shown any scrofulous symptoms, nor had previous debilitating illness ; the latter, because the history of the case, its rapid seizure, acute symptoms, and speedy progress, will assist in enabling us to distinguish it from the more slow and insidious attack of tubercular meningitis or common hydrocephalus. This latter may, no doubt, be ushered in by acute symptoms sometimes, but is generally slower in its progress ; gives more notice of impending mischief ; occurs, generally, in delicate, scrofulous children, who have shown previous symptoms of disease, or have been often ailing ; is characterized by particular states of the nervous and circulating systems, according with the period of its duration ; is attended with more obstinate constipation, a different kind of pain of the head, and a lower degree of general fever, occasionally exhibiting irregular remissions. Closely observing and contrasting these symptoms, we shall seldom fail in making a correct diagnosis, which is most important in a practical point of view.

Acute meningitis can scarcely be confounded with congestion of the brain, unless in an advanced stage, when stupor or coma may have set in. In congestion, we shall not have had the acute pain, quick pulse, burning skin, &c., nor will there be

the frowning, grinding of the teeth, nor severity of suffering generally indicative of acute meningitis. In fact, close observation of the case will seldom permit a mistake in this matter.

Pneumonia in children is often ushered in by vomiting and convulsions, and may be mistaken for head-affection of an acute character. Again, we have symptoms of hydrocephalus occurring in the last stages of pneumonia, from hyperæmia of the brain. Careful attention to the state of the breathing, and examination of the physical signs by auscultation, will generally prevent us falling into error in the early attack, and we shall have had the symptoms and progress of the case to guard us in the later.

To distinguish between acute meningitis and the symptomatic convulsions arising from teething, worms, &c., we shall observe in these latter that the convulsive seizures are less frequent ; there is an interval of comparative quiet between them, in which the pulse and respiration are but little accelerated, and there is an absence of frowning indicative of pain in the head. In acute meningitis there is no marked remission ; often, no doubt, the symptoms are deceptive, and the closest observation will be at fault until the progress of the case reveals its real nature.

Hæmorrhage into the arachnoid membrane is a very rare disease in children ; it does, however,

occur, and has been distinctly described by authors. Convulsions appear amongst the earliest symptoms, but are in general less violent than those observed in meningitis. There is less fever and vascular excitement. Coma occurs sooner and gradually. M. Legendre states, that "children attacked with meningeal apoplexy exhibit contractions of the fingers and toes, a symptom not observed in meningitis." I cannot verify this observation by experience, having never had an opportunity of making or witnessing an examination of a child who had died of apoplexy, and in whom this symptom had been noticed. I am pretty confident, however, that carpopedal flexions do occur in cases of acute meningitis, and in convulsions from other causes.

Inflammation of the brain, running a very rapid course, and proving quickly fatal, may be induced by the extension of disease from the ear ; when a purulent discharge has existed for a long time from the meatus externus, its sudden suppression may be soon followed by indications of mischief, and these should always be promptly attended to.

In Dr. Abercrombie's work on "Diseases of the Brain," an account is given of a boy, aged fourteen years, who had been affected for two months with head-ache and discharges of matter from the right ear. A week before his death the pain increased, and was accompanied by great debility, giddiness,

and some vomiting. He continued in this state, without stupor or any other remarkable symptom, until the day of his death, when he was suddenly seized with convulsions, and died. An abscess was found in the middle lobe of the right hemisphere of the brain, and another in the cerebellum, and there was extensive caries of the pars petrosa, with effusion of three ounces of fluid in the ventricles. The symptoms during life would hardly have led us to expect such extensive disease.

Attacks of otitis are always accompanied by very severe suffering, and it is sometimes exceedingly difficult to say whether we have general inflammation or this local disease to deal with. It may be borne in mind, that the latter is much the more frequent affection in this country. Many children have otitis, more or less severe; few have meningitis. We may gather much from the child's manner, and the position it assumes. In otitis there is not the general wild, phrenzied manner, but rather an expression of severe local suffering. "The child lies on the affected side, and presses it against the pillow, or keeps its hand to the ear." If it can speak, it generally complains of the ear. Sometimes this part is red and swollen, and pressure and examination increase the suffering. Occasionally there is vomiting; but more usually it is absent. After a few hours of great pain, the child generally falls asleep, and awakes free from

all symptoms, except perhaps a discharge of matter, which very often takes place. I have observed in some cases of inflammation of the brain, following upon a long continued discharge and probable extension of disease from the inner ear to the brain itself, that the symptoms were not as acute, nor the suffering so severe, as when the otitis came on suddenly, without previous disease ; but it need scarcely be added that the danger is much greater in the former condition. I have seen several cases fatal from this cause.*

Prognosis.—Whether acute meningitis will terminate in death or recovery depends, in a great degree, upon the cause from which it has arisen, and the period at which it has come under treatment. When arising from direct injury, as penetrating wounds, the prognosis must generally be unfavourable. Several such cases are on record, as wounds in the orbit.† When occurring without any known cause, and met early by prompt and active treatment, it may generally be combated successfully. An impression, indeed, exists, that it is fully as fatal as the slower tubercular form of

* *Vide* two excellent papers, by Mr. Wilde, "On Affections of the Membrana Tympani," in the *Dublin Quarterly Journal of Medical Science*. New Series, Nos. 8 and 9.

† *Vide* a paper by Dr. Geoghegan, on a very interesting "Case of Penetrating Wound of the Orbit," in the *Dublin Medical Press*, No. 177, May 25, 1842.

inflammation—hydrocephalus. My field of observation has not furnished a sufficient number of cases of this disease, to warrant me in giving an opinion from actual contrast.

Examination after death reveals lesions, differing according to the age of the patient and the duration of the disease. In cases which prove fatal early, we find pus, fluid or semi-fluid, or concrete resembling false membrane, in the arachnoid and pia mater, the latter being deeply injected. When death has occurred later, we find false membranes, and the surface of the convolutions sometimes soft and very vascular. The morbid appearances are usually found upon the convexity of the brain, or in the ventricles, which are inflamed and infiltrated with purulent serum. In the tubercular variety of inflammation, the morbid appearances are most generally found at the base of the brain ; and so uniformly is this the case, that M. Rilliet establishes a diagnosis between the two diseases, founded upon this fact.

The cerebral substance may be slightly hardened, or but very little altered in appearance, if death has supervened early ; but if not until after the fifth day or so, it may present an injected appearance, showing numerous bloody dots. In very young infants, the brain is sometimes softened throughout ; the ventricles are generally found empty, or containing only a small quantity of

sero-purulent fluid ; but sometimes we meet with a large quantity of serum in them.

Treatment.—The treatment to be adopted must depend very much upon the stage of the disease in which it has been seen and recognized by the practitioner, and also upon the age of the patient, and in some degree upon the particular form of the meningitis present. As already mentioned, this disease runs a very rapid course, and occurs mostly in strong, healthy children, in whom we might expect to be called upon to use decidedly antiphlogistic measures.

If we see the case early, we must bleed locally by leeches, and if the child numbers four or five years, from the arm or jugular vein as well. The quantity of blood to be abstracted must be determined by the age and strength of the child, and the impression made upon the disease by the evacuation. If the form we have to treat be the convulsive, bleeding must be practised ; but we must early have recourse to the exhibition of purgatives, together with fetid and turpentine enemata. These, with lancing of the gums and the application of cold to the head, should be our earliest remedies. Lancing the gums, though not seemingly necessary, because the teeth cannot be felt, should never be omitted. The enemata will take effect much more quickly than purgatives can, and

by extricating hardened fæces and flatus, will afford much relief. When symptoms persist, after the use of such means, tartar-emetic will be found a most valuable remedy, though some difference of opinion exists as to the propriety of using it. When we consider the power it exercises in assisting to subdue other severe inflammatory affections, there does not appear any sufficient reason to prevent its application in this. Nausea, kept up for some hours, will often give a most beneficial check to the rapid progress of symptoms.

The warm bath is another remedy I would recommend the early trial of ; indeed it is so very popular, that we shall be generally anticipated in this respect. It allays general irritation, equalizes the circulation, and tranquillizes the patient. Cold applications to the head should always accompany and follow its use.

Hours are of as much importance in this affection as days in some others ; indeed the changes of a single hour, for better or worse, are sometimes very marked. If symptoms continue unrelieved, we must persevere with our remedies. Purgatives are to be repeated, and the loss of blood may again be called for. Some authors recommend applying leeches to the knee, or some distant part, as a derivative. Fomentations to the lower extremities and sinapisms will also be of use with this view.

Much reliance must be placed upon the speedy

introduction of mercury. We cannot expect to salivate very young infants, but the system may be influenced, notwithstanding. Mercurial frictions are to be used; they assist in accomplishing this object, and spare the stomach. If we have used blisters, the surfaces may be dressed with mercurial ointment, with the same effect in view.

I would recommend the early shaving of the head, and application of counter-irritants to the scalp, more especially when we have reason to suspect that the retrocession of a cutaneous affection may have had any share in inducing the disease. Tartar-emetic ointment, with croton oil, will generally be sufficient for this purpose. Before having recourse to this latter means, in cases where we do not suppose that the disappearance of an eruption has had anything to do in producing the meningitis, the application of cold should be long and perseveringly tried. A thin towel, frequently wetted and kept upon the head, seems as good a method of using this as we can select. Ice, in bladders, is also recommended; and a method of slow irrigation, by means of a thread, conducting cold water from a vessel placed over the child's head, is recommended by M. Rilliet. I have had the child's head held over the side of the bed, and cold water poured in a stream from the spout of a tea-kettle, for several minutes, with decided benefit.

In our attempt to introduce mercury into the system, we need not fear to combine it with small quantities of opium. The tendency to coma is not so great as to be increased by the latter, to any alarming extent. Small doses of Dover's powder will be found very useful in allaying irritation and procuring sleep.

Such active treatment as this recommended will frequently succeed in arresting the disease ; but unfortunately we are often disappointed, and it runs its rapidly fatal course, unchecked, in from twenty-four hours to three days. I have never known any benefit derived from the exhibition of medicines with the view of checking the vomiting. The child generally asks for cold water, when able to speak, and this he should have freely. I should mention that we must be careful not to persevere in the use of cold to the head too long, if we have reason to apprehend the supervention of coma. Blisters applied to the nape of the neck will lessen this tendency, and some recommend them to the inside of the thighs and legs also. The blister on the neck may be kept open with advantage for some time, even after all severe symptoms have disappeared. It will be necessary to guard against noise and light, and also to avoid every needless excitement.

HYDROCEPHALUS ACUTUS.—TUBERCULAR MENINGITIS.

Amongst the affections of the head to which infancy and childhood are liable, none occupies a more prominent position than hydrocephalus. It is the disease of every stage of early life, and happens at all seasons. Perhaps we are not justified in so closely connecting its occurrence with the periods of dentition, as that of the disease already treated of under the name of acute meningitis; neither should we be quite correct in saying that those epochs do not exercise an influence over it. Certain it is, that we encounter it at all times, and under all circumstances; but, as will hereafter be shown, it is so very often preceded by, and seemingly dependent upon, derangements of the digestive apparatus, and these so constantly accompany the periods of dentition, that we may safely say there is a very great liability to its occurrence at those times.

Modern practice of medicine may fairly boast of the improvements effected in this particular branch. In the early notices which we have of this affection, its real nature seems to have been very imperfectly understood. It was, indeed, recognized as a peculiar disease, but there was a lamentable want of information as to its pathology and treatment. The effect was looked upon as the

cause, and the name was not applied until symptoms showed themselves which were thought to depend upon the effusion of fluid. We now know that there are not any symptoms which clearly and unequivocally point out the occurrence of effusion into the ventricles,—those cases which have proved fatal, exhibiting the worst symptoms, severe convulsions, strabismus, coma, &c., often, upon dissection, furnishing the least quantity of watery effusion, and *vice versa*. In fact, we are fully warranted in asserting that, until the later periods of the preceding century, there existed great obscurity in the diagnosis, very erroneous views of the causes and pathology, and necessarily a very unsuccessful method of treating this disease.

The authors who wrote about it described the symptoms with considerable accuracy, each succeeding one adding something to the general amount of information ; but all seem to have had their attention arrested by the consequence rather than the cause, and to have been at greater pains to account, by hypothesis, for the occurrence of the serous effusion, which generally took place in the later stages, than to trace the origin of the disease itself, or apply themselves vigorously to its successful treatment. Indeed at this time it was generally pronounced incurable ; and so very hopeless did they consider the cases, and so little reliance was placed upon treatment, that one physician of

eminence writes thus :—"I do not suggest any probable means of curing the disease, which has baffled my skill, both when alone and when in consultation with the ablest of the faculty ; and as I do not deem the cure of it within the compass of art, the ostensible reason for publishing this paper is to exhibit such an idea of hydrocephalus, as may serve to make its fatal tendency known to the practitioner, so as to justify him to himself, and to those who might deplore his ill success."

Occasionally, however, a very unpromising case terminated favourably ; and, by degrees, the light of science dawned upon this dark and intricate path. Perhaps Dr. Whytt was the earliest systematic writer upon hydrocephalus, whose work effected an improvement. He described the symptoms most accurately, and was the first to adopt the division into stages, which all succeeding authors have followed. Some twenty years afterwards, and at about the same period, Drs. Rush of Philadelphia, and Quin of Dublin, conceived new views of the nature of hydrocephalus, and shortly after published their opinions,—that it was in reality a disease of an inflammatory nature, and that the watery effusion was a termination of this inflammation, and not a cause of the disease, as hitherto supposed. Dr. Quin supported his views by dissections of some cases which had proved fatal, showing that "there were remains of greatly

increased vascular action in the brain, and yet no effusion of fluid had taken place, although there had been unequivocal symptoms of hydrocephalus present :” and in other dissections he also proved, that “ while the quantity of serum effused was considerable, the blood-vessels were remarkably turgid ; and what was still more decisive of inflammatory action, preternatural adhesions connected the meninges, which were thickened, opaque, and coated with coagulable lymph.” Dr. Rush also published cases supporting his views as to the inflammatory nature of the disease, and adding considerably to the pathological knowledge of it. Still his ideas, as to its intimate nature, do not accord with the opinions of modern physicians ; he considered it as almost identical with phrenitis, differing in degree only, and hence he named it “ Phrenicula.” With more correct views of the nature and pathology, came improvements also in the treatment, and this hopeless and incurable disease became more manageable. Mercury, which had been recommended by Dr. Dobson in 1775, cold applications to the head, and blisters were used ; physicians laid aside despondency, and applied themselves with energy to the study of the malady.

To the late Dr. Cheyne of Dublin, we are particularly indebted for an able essay upon this subject, published in 1808, and followed by a

second in 1819. These papers effected more towards classifying symptoms, facilitating diagnosis, and improving practice, than any of their predecessors. Dr. Cheyne dwelt particularly upon the frequent connection between disease of the alimentary canal, and the occurrence of symptoms of head-affection, and pointed out with accuracy the early symptoms which characterized hydrocephalus; he also forcibly inculcated the necessity of using prompt measures, in order to secure success in our treatment.

The disease had been, before Dr. Cheyne's time, divided by Dr. Whytt into three stages, that division being founded chiefly upon the variability observed in the state of the pulse, at different times, during the progress of the disorder. Cheyne also recognizes three stages, but founds the division upon a more constant and unerring occurrence, namely, the state of the sensorium at those particular periods. To the stages of quickened pulse, slow pulse, and again quickened pulse of Whytt, correspond the stage of increased sensibility, the stage of diminished sensibility, and the stage distinguished by palsy and convulsions of Cheyne; but, as he observes, "The student will be disappointed if he expects that these stages will always follow each other in a regular and measured progress." Very great variability is observed in cases, both as to their duration, and the distinctness with

which the different periods, or stages, can be recognized. We may remark that these will be most distinct in those cases which are slow in their progress.

Many other English authors have laboured in this field, and have added much to our information, both as to the nature and treatment of hydrocephalus. The principal improvements consist in having facilitated the diagnosis, and confirmed the necessity for antiphlogistic treatment, and such as will improve the state of the biliary and other digestive organs. We are much indebted to our continental brethren also, for their additions to the literature of this subject. To their minute pathological investigations, we principally owe our knowledge of the fact, that hydrocephalus has almost always a tubercular origin, and that it is frequently complicated with tubercular deposit, elsewhere than in the brain. Gölis's treatise is deservedly looked upon as most complete, and MM. Guersent, Rilliet, and Barthez have contributed much useful information. To their works, and also to the able lectures of Doctors West and Willshire, I beg to acknowledge my obligations for many useful hints.

Having brought the history of this disease down to modern times, we shall proceed to consider it in the manner already set forth, passing in review

its causes, symptoms, diagnosis, prognosis, and treatment.

After a careful perusal of various works, it appears to me that the account of the origin and progress of this disease given by Dr. Cheyne, is by far the clearest, most concise, and withal most true to nature of any I have met with. Any attempt upon my part to improve it would be so futile, that I shall take the liberty of quoting from his work such portions as more particularly bear upon the object we have in view.

From great experience and close observation of the disease, Dr. Cheyne was led to believe that hydrocephalus very often depended upon, or was the consequence of, a disordered condition of the digestive apparatus, and that the liver was the organ most frequently at fault. The observations of subsequent practitioners have fully borne him out in this opinion, and the less frequent occurrence of the disease, and the many times it is warded off, or arrested, by early attention to those organs, fully attest the value of his observations, and the practice inculcated.

Before proceeding with the consideration of the different stages of the disease, and the symptoms characteristic of each, we shall notice the circumstances under which it is most frequently met with, and the causes which give rise to it.

In the first form of the disease which Dr. Cheyne notices, he says :—" We find that before any characteristic signs appear, the patient for some days, or even weeks, has complained of pains in his head or belly, while at the same time he has been slightly feverish, dull, vertiginous, sallow, without appetite, or perhaps with an increased or capricious one, and with a considerable disorder in all the functions of the abdominal viscera. In some instances a dragging of one of the legs has been observed, which has led to a fruitless examination of the hip-joint and spine. In others, a very painful crick in the neck has taken place, as the first symptom of disease. These complaints arise gradually, and the child's friends are not awakened to a sense of danger, until, advancing a step farther, the commencement of a specific disease has more distinctly shown itself. The dulness and severe pains are now accompanied with vomiting, usually upon getting up in the morning, or after the child has begun to stir about : yet even this symptom is often disregarded until the second or third time of its recurrence, and the disease has made considerable progress before the condition of the patient is suspected to arise from a disordered condition of the brain. When the attention is more particularly excited by these symptoms, the head-ache, or pain in the forehead, will be observed returning at shorter

intervals. The child often affectingly complains of his head ; he sighs frequently, is dull, his head requires to be supported, he complains of weariness in his eyes, the pupils appear unusually contracted, and he has an aversion to light ; but in the dark, he sometimes fancies he sees flashes of light. His tongue is white, and his belly generally costive. The stools at first are of the colour of clay, but as the disease advances, they become of a gelatinous consistence, of a dark-green colour, and they have a peculiar smell, not unlike the smell of the breath in the beginning of some of the exanthemata. The pulse becomes quick, and at particular times these symptoms are attended with febrile heat and irritability, and the child complains not of head-ache only, but of pains in different parts of the body, which are sometimes exceedingly acute. At one time he will complain of pains in his limbs, at another of pain in his breast, or in the nape of the neck, very often in his bowels, but before his friends can make any preparation to relieve him, the pain ceases, or is transferred to some other part ; at another time he will lie long on his mother's knee, restless and whining, from dull rheumatic pains. These disorders cannot last long without impairing the child's strength ; accordingly, in ten days or a fortnight, the period usually occupied by the first stage of this attack, his ap-

pearance is altered, his manner becomes peevish, his hand tremulous, and his gait tottering.

“In the second variety, which is less frequent, the disease runs a more rapid course. After the child has been in a drooping state for a short time, which, although it sometimes may escape observation, is generally recollected, there is a sudden change to a fever, attended, even from the first, with a great degree of pyrexia, with frequent, but short and irregular remissions, flushing, severe head-ache, tenderness all over the abdomen, and increased sensibility, with, sometimes, brilliancy of the eyes. It is said to be often difficult immediately to distinguish hydrocephalus from fever, and this is the form in which there is the greatest resemblance between the two diseases; but we are led to suspect some deeply-seated evil, from his frantic screams and complaints of his head and belly, alternating with stupor, or rather lowness, and unwillingness to be roused; and we are struck with the great irritability of the stomach, which exists, in a degree beyond what we generally find it in the fevers of this country, retching and vomiting being brought on by a change of posture, and certainly by every attempt to sit up in bed; and the disordered state of the bowels which attends this irritability of the stomach is also remarkable; and when at any time the child has a little respite from the violence of

these symptoms, we find our suspicions confirmed by his look, for when the features do not express pain or terror, there is not unfrequently a vacancy of look, the eyes being set, with an expression of dejection which is peculiar to certain diseases of the brain."

Dr. Cheyne observed less frequently than the first case, yet more so than the second, what may be described as the third form of hydrocephalus. This last may be considered as an instance of conversion of disease, and is attended with considerable variety of symptoms :—" When hydrocephalus arises during an indifferent state of health, as for example, after there had existed a scrofulous disease which has subsided, or where, from predisposition, and from the anomalism of symptoms, some such disease might have been expected ; or where the child has had some epidemic disease, as measles or scarlatina, from which he has not perfectly recovered, or regained sound health, the attack is sometimes made with all the violence which I have described as distinguishing the second form. When, again, the attack comes on as the sequel of an acute disease,—as, for instance, remittent fever, hooping-cough, dentition,—the child almost imperceptibly slips into hydrocephalus. There are scarcely any of the symptoms of the early stages, and paralysis and convulsions are sometimes the first indications of the new disorder."

These descriptions apply chiefly to the early periods of each variety ; for in the latter stages the symptoms become less distinctive, and there is little diversity.

Causes of Hydrocephalus.—This disease is sometimes endemic, particular localities being more subject to its occurrence than others.

Without question, it is an affection more frequently attendant upon the strumous diathesis than any other ; indeed the best authorities hold, that it occurs only in children of a scrofulous habit, or born of scrofulous parents, and also that it may be directly produced by conversion of that disease from another part to the brain, not by simple metastasis of symptoms. Whatever causes, then, operate to generate or bring into activity latent scrofula, will have a tendency to induce hydrocephalus. Hence the frequency with which we find it occurring amongst the children of the very poor inhabitants of large cities, who have not had a sufficiency of wholesome food, and who generally occupy filthy and ill-ventilated houses. These causes give rise to disorder of the digestive organs and scrofula, and from these, again, springs hydrocephalus in all its forms and varieties. That such is the case, may be fairly inferred from the fact of the disease being frequently arrested in its early stages, and the symptoms removed by pro-

per attention to relieve the disordered condition of the chylopoietic viscera.

When we meet with hydrocephalus amongst the upper classes of society, we shall generally find either that scrofula is active in the parents or children, that there has been too great a forcing of the intellect of the child, who is, perhaps, naturally precocious, or that some of the causes which produce disordered digestion have been in operation, such as over-feeding, improper food, irregularity in the hours for meals, badly-ventilated sleeping apartments, &c.

Hydrocephalus sometimes follows the exanthemata, measles and scarlatina more particularly ; it often arises during long-continued or mismanaged remittent fever.

It is no unusual thing to hear of several children, of the same family, having been carried off by this disease, and frequently at about the same age ; neither is it uncommon at this time to have individuals pointed out who were snatched from the very brink of the grave, (when labouring under hydrocephalus, or its early symptoms), by prompt and efficient treatment. It is most certain that in families where one child may have been taken, anxiety is earlier aroused, and attention directed to the treatment of the first symptoms of the malady.

Hydrocephalus sometimes, but rarely, follows

upon falls and blows received upon the head. It is very often attributed by parents to such, though the length of time which may have elapsed, between the infliction of the injury and the appearance of the disease, will have been sufficient to allow some of the causes above-mentioned to be in operation.

I have frequently seen hydrocephalus, very rapid in its progress, though not acute as to suffering, follow long-existing diarrhœa, itself the consequence of deficient or improper nourishment.

We may say, then, that every debilitating cause, and all sources of general irritation, as dentition, may become exciting causes of this important disease.

Symptoms of Hydrocephalus.—The description already given of the manner of attack of the different varieties of this disease, has included the notice of some of the most usual and prominent symptoms. When once fairly established, hydrocephalus may be easily recognized ; but its early detection is of such vital importance, and there is such a possibility of its being overlooked for some time, that I shall enumerate the symptoms in the order in which they most usually occur,—the nervous, circulatory, respiratory, and digestive systems being separately considered.

If we have been induced to observe closely the

state of a child's health, either by its altered manner, or the occasional complaint of uneasy sensations and anomalous pains, and that hydrocephalus impends, we shall perceive very much the following order of symptoms :—

Nervous System.—There will be noticed a degree of restlessness and irritability about the child's manner. Its temper will be very much altered ; if very young, it will not leave the mother's or nurse's arms, and even whilst therein, is ill at ease, whining, and evidently distressed. The countenance betokens anxiety ; the eyes are heavy, and wanting in the usual intelligent look of a healthy child ; the pupils are generally preternaturally contracted, and there is an aversion to light and noise. This intolerance of light is sometimes first noticed at night, when a candle is in the room, at which an infant usually gazes fondly. The child, if in arms, often expresses sudden alarm, as if it were giddy and afraid of falling ; if somewhat older, he becomes languid, and easily fatigued ; declines play, and takes little pleasure in his usual amusements. He complains of pains in various parts of the body, the head, neck, the arms, and legs. The pain of the head is the most continuous ; it may be in the forehead, or towards the back of the head ; sometimes dull and constant, occasionally increased in violence, and often so severe as to cause the child to scream out. This occurs very frequently

during sleep, when he will awake frightened and uncollected, but it is not an invariable symptom. I have seen fatal cases which were not characterized by severe pain in the head, and screaming out was not at all observed in some of them ; but I have generally found, that at some period of the illness, perhaps several days before my attendance commenced, there had been some severe pain of the head, lasting, perhaps, for only an hour or two.

In one fatal case, which was under my care, the very earliest complaint of pain in the head was made whilst the child was being driven over some newly-laid-down broken stone.

Circulating System.—We shall very early perceive evidence of increased vascular action ; the pulse will be some beats quicker than is natural, varying in this respect very much at different periods of examination ; it is very irregular, “sometimes beating ten or twelve strokes at the rate of sixty in the minute, and the next six or eight at the rate of 100.” It is greatly increased by exertion, such as sitting up in bed, and there is sometimes a wiry harshness about it. Permanently increased pulsation of the carotids may also be generally noticed, and this, too, may be observed in the fontanelles, if still unossified.

Respiratory System.—As yet the respiratory system may not have become affected, but there will generally be observed a tendency to sighing, and

there is frequently present a short, dry, hacking cough, not to be accounted for by examination of the chest.

Digestive System.—We generally find vomiting more or less constant ; often pain in the bowels, which are either confined or irregularly free, the stools passed or procured by medicine being fœtid, and indicating an unhealthy bilious secretion. There may be general tenderness of the abdomen, more particularly in the hypochondriac regions ; the tongue is foul, and the breath has a heavy, peculiar smell. Vomiting is a symptom usually present early, and its occurrence and frequent repetition in children should never be overlooked, which is more likely to be done in infants suckling than in those more advanced. The vomiting at first may depend, in part, upon the deranged state of the stomach itself, the functions of which have been for some time imperfectly performed ; but after a short time, it arises from evident sympathy in connection with the state of the brain. This may be inferred when we observe it occurring every morning, when the child first gets up, or begins to move about. I have more than once observed vomiting two or three times in the day, with languor and altered manner, to be the very earliest symptoms indicating the approach of cerebral disease. The appetite for some time past will

have been variable, and, most likely, emaciation may have taken place to a considerable extent.

Such are the symptoms most usually to be observed in the earliest stage of hydrocephalus. It must be borne in mind, however, that they will rarely be found exhibiting the regularity of grouping here presented. Some will be more prominently present and severe ; others, perhaps, entirely wanting. It should also be mentioned, that there is a great tendency to irregular remission observed in many of them.

Of so very great importance is the early recognition of this insidious disease, and so much of the success of our treatment depends upon the time at which it is commenced, that I think I cannot better lead any inexperienced reader to the point we would wish, than by quoting from Dr. West's admirable lectures the following passage:—"The painful sensations which the infant experiences soon show themselves in the haggard, anxious, or oppressed looks, which take the place of the naturally tranquil expression of its countenance. It often puts its hand to its head, or beats or rubs it, or, while lying in its cot, bores with the occiput in its pillow, owing to which, in children who have suffered for any time from uneasy sensations in the head, you will often find the hair worn off the occiput. It turns its head away from the light, and lies much with its eyes half closed, in

a state of apparent drowsiness, from which it often arises with a start, and cries. The cry, especially in inflammatory disease, is peculiar; it is, generally, a low, almost constant, moan, very sad to hear, occasionally interrupted by a sharp, piercing, lamentable cry, almost a shriek. You fear that disease is going on in the brain. But is the skin hot? Is there heat of head?—are there frequent flushes of the face?—and does the accession of each flush seem connected with an increase of agitation and distress, or followed by a deepening of the drowsiness? Is the fontanelle prominent and tense, or are the pulsations of the brain to be felt with unusual force through it? Are the veins of the scalp full?—or do the carotids beat with unusual force? What is the character of the pulse? Is it not merely increased in rapidity, but, even when examined under exactly similar conditions, does it afford a different result each time? Do you find it irregular in frequency, or unequal in the force of its beats, or even distinctly intermittent? Again, what is the state of the pupil? Is it generally contracted, so as to exclude light as much as possible from the over-sensitive retina?—or is it usually dilated?—and does it act slowly, as though disease had deadened the sensibility of the nervous system?—or do the pupils of the two eyes act simultaneously, or one more readily than the other? Do the pupils

oscillate under the light, at first contracting, then dilating, and either remaining dilated, or continuing to oscillate, though within narrower limits, and with a tendency to remain more dilated than at first?—or, lastly, do you find, when the child is roused, this oscillation of the pupil going on under the ordinary amount of light that enters the chamber? Now, all these are indications of disordered function of the brain, and many of them point to disorder of a very serious kind. But there are yet other sources from which we must not neglect to seek for information. Much may be learned from the state of the digestive functions; the bowels are almost always disturbed, usually, though not invariably, constipated, while nausea and vomiting are seldom absent, &c.”

If we suppose the preceding symptoms to have been neglected or unrelieved, we shall be led to the consideration of the second stage of the disease—Whytt’s stage of slow pulse, Cheyne’s stage of diminished sensibility.

“The child appears heavy and lethargic, exhibiting a subdued manner. He is incapable of fixing his attention, and seems to wish to be let alone. He is unable to sit up, even for a short period, and if in arms, hangs his drooping head over the mother’s shoulder; exhaustion follows every exertion, mental or bodily. There is a tendency to delirium, and often a marked inclina-

tion to slumber, the child falling off in a doze immediately after having been roused to answer questions. From this doze he is often awake by sudden starts of pain ; in general, there is not much complaint of severe pain in this stage. We shall observe dilatation of the pupil, want of consent between the eyes, and imperfect, and not unfrequently double vision." There will also be noticed in infants, a continual knitting of the brows and frowning, without crying.* Convulsions are not usual in this stage, but occasionally the disease progresses so rapidly, that our division into distinct stages cannot be perceived, and convulsions will come on quickly.

Circulation.—The pulse will still be found variable and irregular, generally slower than in the more advanced period, but easily doubled by any exertion. As the degree of torpor increases, the pulse also becomes slower ; I have felt it so low as forty beats in the minute. There are frequent flushings, alternating with paleness. The skin is usually hot and dry.

Respiration.—The breathing is low, irregular, and sighing ; this latter is very constant in occur-

* M. Trousseau states, that it may be laid down as an aphorism, as seldom liable to exceptions as those of Hippocrates, that when a child sheds tears, a favourable prognosis may be delivered, however menacing the symptoms ; while, when this is not the case, in painful diseases, and especially if the eyes are dry and sunken in the orbits, great danger to life exists.—*Gazette des Hopitaux*, 1848, No. 14.

rence. You will be often struck, upon entering the room, by the deep sigh and tired method of turning in bed, of a child suffering from hydrocephalus. The peculiar cough is also frequently still present.

Digestive System.—Vomiting still continues, and is, perhaps, more frequent. There is not very much retching, but a peculiar kind of gulp, induced by every change of position. The matter ejected is generally mucus mixed with bile. The tongue presents a marked appearance, easily remembered when seen, but not very readily conveyed by words. It is not foul nor loaded, but lightly covered with a whitish fur, at the back and in the middle, or in patches, and, perhaps, quite clean and moist at the edges and intermediate spaces. It always conveys to my mind the idea of irritation existing in the mucous membrane, and may be more the effect of such in the alimentary canal, and of medicines exhibited, than any result of the cerebral affection. There is not in general much thirst. The bowels are now usually very much constipated, yielding only to the effects of strong purgatives; the stools present that peculiar greenish appearance and gelatinous consistence, so well known in this disease, and before alluded to; they consist chiefly of mucus, mixed with unhealthy bile. There is sometimes suppression of urine, and dryness of the nose is also noticed.

There is much to be observed in the manner of the child during this stage : the method of lying in bed is generally on either side, one hand being placed under the head, the other, perhaps, holding the organs of generation ; the incessant picking at the nose and lips, and rubbing of the former attract our attention. This stage is most uncertain in its duration, the patient sometimes lying for many days without any decided change ; sometimes he becomes rapidly worse, and a convulsion, followed by stertorous breathing, will prove fatal. The heat of the head, and tenseness of the fontanelle, are generally very remarkable about this period. I have frequently seen the body partially covered with a clammy perspiration also.

When the symptoms of the second stage have existed for a certain period, the third takes its place by imperceptible degrees. The expression of the countenance becomes vacant, the eyes are suffused, there is a hectic flush occasionally upon the cheeks ; the child is, perhaps, quite insensible, or, when roused, with difficulty answers questions. There is sometimes raving. The pupil will now be found dilated and inactive ; perhaps there will be strabismus, and, most frequently, convulsions or paralysis of one side. I have seen death occur without either convulsion or paralysis ; the unparalysed arm is kept in constant motion, waving backwards and forwards, or picking the nose or

bed-clothes. The pulse will have become quick and thready; sometimes, especially after a convulsion, flying; the breathing hurried and irregular, presenting that character so well known in fever as cerebral breathing. As death approaches, "the face becomes purple, then sallow and marbled in complexion." Convulsions increase in frequency; there is incessant tossing of the head, and boring into the pillow. The urine is very often retained, and the bowels continue constipated. Death usually takes place during a severe convulsion, or by a gradually increasing coma. In this very advanced stage, there is to be observed a peculiar champing of the lips and jaws. I have also noticed a very remarkable avidity in the method of grasping a cup offered with drink, by the unparalysed hand and lips, and also that a child will sometimes, until within a few hours of dissolution, take greedily, and chew and swallow biscuit or bread placed within its lips.

The disappearance of flatus from the intestines will have caused a falling-in of the parietes of the abdomen, or retraction, which is generally noticed; emaciation is extreme, and the countenance has assumed an old, wrinkled appearance.

Diagnosis of Hydrocephalus.—This is a subject demanding the very closest attention we can possibly bestow. The observation of the various

symptoms already enumerated and grouped, supposing them to occur with great regularity, would, no doubt, be sufficient to enable us to recognise this disease, when present, with tolerable certainty ; but I must admit, and I am sure that many others, who have seen much of cerebral affections in infancy, will join me in the acknowledgment, that the diagnosis of the positive existence of hydrocephalus is often a very difficult and anxious matter. So many of the symptoms are more or less common to other diseases of as frequent occurrence, so many are sometimes wanting, or, if they have been present, may have disappeared, and often so little can be gathered from the patient himself, that we are sometimes at a loss to pronounce early upon the nature of our case. Here, again, I will repeat the advice of Dr. West, and say,—“That we must be greatly guided by the history of the case, and the consideration of the entire of the symptoms.”

Simple acute meningitis may, in general, be early known and distinguished from the tubercular form, by closely investigating the cause and history of the disease ; by observing the appearance and general health of the child we have to deal with ; by noticing the violence of the attack and rapid increase of bad symptoms, viz.—very acute head-ache, delirium, coma ; by the incessant vomiting, thirst, and higher fever present, almost

from the first. Constipation does not form so prominent a feature of the acute attack ; the aggravation of the disorder is very quickly progressive, while in the tubercular form the course is comparatively slow, irregular, and often much prolonged.

Acute meningitis has been known to prove fatal in twenty-four hours. When it follows upon any special cause, such as eruptive fever, scarlatina, for instance, that previous occurrence will form a great aid in our diagnosis.

Meningeal apoplexy and cerebral hæmorrhage are so very rarely met with in children, that they will seldom cause us much trouble. Where any obscurity exists, we may remember in those cases the irregularity and sudden accession of symptoms, the absence of quick pulse and febrile excitement, with the early supervention of convulsions and delirium.

Hypertrophy of the brain, and phlebitis of the sinuses of the dura mater, are very rare occurrences also ; the former disease is very slow in progress, and attended with visible enlargement of the head, from a yielding of the parietes, when it occurs in the very young child, or has made much progress ; a very slight attention to, and study of the case, will reveal the true nature of the affection. I have not seen phlebitis of the sinuses, but it has been accurately described and diagnosed. When it occurs, the early symptoms are exceed-

ingly acute, and followed soon by syncope, dilatation of the pupils, strabismus, grinding of the teeth, alternate relaxation and contraction of muscles, &c.

The diagnosis from convulsions, arising from worms and other remote causes of irritation, must be made by close attention to the history of the case, and examination of physical signs of disease elsewhere.

The convulsions which are caused by pneumonia in children, and those from spasmodic croup and spasm of the glottis, are generally accompanied by such a train of symptoms as will throw sufficient light upon their causes, and there is very little likelihood of a mistake being made as regards them.

Typhus Fever.—I have never found any great difficulty in recognizing typhus fever in children; it, however, may be mistaken for hydrocephalus, from the occurrence of head-symptoms. It is not a common disease amongst children, and seldom attacks them, unless others in the house happen to be ill of it; under which circumstances, I have seen it in children of all ages, even those at the breast. The loaded brown tongue, the suffused eyes, the constant thirst, the burning skin, the diarrhœa, petechiæ, and general absence of convulsions, paralysis, and other peculiar cerebral symp-

toms, usually present in the diseases of the brain, will serve to distinguish between them.

Remittent Fever.—It is in this affection that we sometimes experience the greatest difficulty in forming a correct diagnosis ; very many symptoms are common to the two diseases, and experience and tact alone can enable us, betimes, to draw correct inferences. Dr. Willshire says:—" Now and then, even with your greatest attention, however, you will find yourself at a loss to diagnose between certain forms of remittent fever and particular stages of tubercular meningitis. I have, now and then, been at a loss to say whether the head-symptoms which were present, together with much heat of skin, febrile exacerbation, and derangement of the digestive system, were really secondary to the febrile disturbance, and were to be viewed as likely to yield as the fever subsided, and that they were only evidences of temporary irritation of the nervous centre. In such cases, I have always acted, however, very carefully, as I know that this temporary cerebral irritation and congestion of the nervous centre, not uncommon in the remittent fever of childhood, may, in a scrofulous child, lead on to perfect development of an intercurrent form of the true meningitic disorder."

Thus is the subject viewed by an experienced practical man ; and from the latter part of the paragraph quoted, we may gather his conviction,

that the one disease often leads to the other. In fact, the line of demarcation between them is frequently ill-defined, and a disease comparatively common in its occurrence, and not usually followed by serious consequences, becomes gradually transformed into a most dangerous and fatal malady. I would again warn those who may have charge of cases of remittent fever, to watch, closely and anxiously, every change ; the less frequent the remissions, the greater danger would there seem to be of the invasion of hydrocephalus. Our diagnosis may be assisted by observing, in the former, those remissions occurring with regularity. The countenance, too, though expressive of suffering, is different from that in hydrocephalus ; the lips are retracted or drawn, so as to show the teeth or gums ; the countenance is pale, or sallow and sunk. The child seems to dread motion, lies on the back, with the knees bent or drawn up, and is pained by pressure on the abdomen. "Here, neither the brow is knit, nor the pupil of the eye is affected." (*Maunsell and Evanson.*) The heat of the skin is much greater in remittent fever ; the pulse, also, is quicker, and the thirst more intense ; vomiting, too, is more constant. The tongue is more loaded, and sometimes is red and pointed ; the evacuations are very different in remittent fever, and procured with greater ease, diarrhoea rather than constipation being present. The lips are gene-

rally red, chapped, and fissured, and there is often stomatitis or general abdominal tenderness. Such are the principal points of difference between the two disorders ; but candour obliges me to say, that the distinction seems easier made upon paper than by the bed-side of the patient. I would take this opportunity of bearing testimony to the general accuracy of, and great value to be attached to, the observations of mothers ; naturally acute, their powers of observation seem heightened by parental anxiety, and they have time and opportunities for making remarks that we cannot command. Put yourself, then, in full and free communication with the mother ; tell her what you suspect or wish to ascertain, and direct her attention to the matters you want elucidated. This will serve you far more than a "dignified reserve," and cannot injure your patient, (provided a proper time is selected for the conversation,) as might be the case were he of more mature years, and likely to be excited by being told a good deal of the doctor's opinion.

Dentition is often accompanied by the occurrence of head-symptoms, convulsions being that most commonly seen. The exanthemata, especially scarlatina and small-pox, are frequently preceded by them also. Here we must make and pronounce a most careful and guarded diagnosis. Examine accurately the state of the gums ; observe if there be uneasy sleep, with frequent starting,

burning hot mouth and breath, sucking the finger, or any other convenient matter within reach. Look also to the state of the bowels ; these are generally loose, but the evacuations are unhealthy in appearance ; a constant thirst also generally attends. In those cases in which I have seen head-symptoms antecedent to the exanthemata, delirium seemed the most prominent. There was extreme heat of skin and great restlessness ; vomiting was not often present. The first appearance of the eruption is followed by some relief. If scarlatina threatens, we have the additional diagnostic marks which the peculiarity of the tongue and the smell of the breath afford. In measles too, we may generally be assisted by observing the catarrh and derangement of the mucous membranes, which usually precede. But Dr. Willshire notices, "that we may find a difficulty in diagnosing a case of 'rubeola sine catarrho.'" Such I have lately met with in a boy of ten years.

The same authority also mentions, that "where the exanthemata are ushered in by head-symptoms, there is not the constipation which is observed in the meningitic disorders ; nor, in the younger children, the tense fontanelles."

For the means of diagnosing between hydrocephalus and the hydrencephaloid disease, we must refer to our account of that affection.

Many other causes may give rise to head-symp-

toms in the child, and these must be borne in mind ;—worms, constipation, retention of urine, hooping-cough, acute inflammatory affections of the internal ear, and caries of the temporal bone, or suppression of a discharge from the external meatus. The diagnosis of each and all of these must depend upon the ability and experience of the individual in charge.

Prognosis.—Owing to the additional knowledge acquired of the true nature and pathology of this disease, and the line of treatment in consequence adopted, instead of, as formerly, viewing every case in the worst possible light, we are, fortunately, enabled occasionally to pronounce a favourable prognosis. This, however, must be taken to apply only to the very early stages, and to those cases where the symptoms have been soon recognized and promptly met. All authorities, British as well as continental, look upon the disease as incurable, when fully established ; still, however, as we mentioned that formerly very unpromising cases occasionally recovered unexpectedly ; now, too, we see those which have reached the second, and even third stages, with all the alarming symptoms present, sometimes rally and do well. Our prognosis, then, must be very cautious and guarded ; it need never be absolutely hopeless. The very worst symptoms occurring in hydrocephalus cannot be

received as evidence of organic lesion having taken place ; and whilst this is not the case, we need not entirely despair.

“ When the cerebral symptoms have come on insidiously, as the sequel of a previous disease, in a child of a strumous habit, or one having a family predisposition to the disorder, much danger is to be apprehended, and the result is most frequently fatal. The more acute the inflammation, on the contrary, the greater, in general, is the chance of cure, and the better is active depletion borne ; such cases usually occurring in healthy children. Recovery may also be generally effected when the disease sets in subsequently to scarlatina, if we are prepared to meet the case, as the symptoms are often very sudden and acute.” (*Maunsell and Evanson.*)

In individual cases, we must be guided in forming our prognosis by the presence and progress of particular symptoms.

When convulsions, if they have been present, cease, or diminish in frequency and severity ; when the bowels become more amenable to the action of medicine, accompanied by an improved appearance in the evacuations ; when the skin becomes moist, the urine more copious, and a watery discharge from the nose takes place ; more particularly when the pulse becomes more regular in its

action, and the breathing natural, we may cherish good hopes.

We must not confound the slow pulse of the second stage of the disease with a natural lowering, indicative of improvement. Indeed it will not require very much tact to perceive a real improvement; there is generally a consonance in all the symptoms of amendment, when such occurs.

We must also remember the deceitful remission, "the lighting-up before death," and not be entrapped into raising hope, so soon to be dashed. All authors notice this occasional recovery of reason and temporary disappearance of bad symptoms. The cause of such it is not easy to give, but we may mention that the same occurrence frequently takes place before death in the insane. It would seem as if two such morbid actions could not go on together in the system.

Pathology.—Much may be gathered from the preceding notice, of the pathological conditions likely to be found in the brain and other organs. They may be arranged in two classes,—those arising from the presence of tubercle, and those the result of inflammation. As with the symptoms, so with the pathological appearances; they are not by any means uniform in their character or occurrence. All the symptoms of hydrocephalus may have been present, and its usual stages have been

distinctly passed through, and still examination of the brain reveal but trifling lesion. When the symptoms have been acute, and the progress of the disease rapid, the effects of inflammation will be most apparent ; and, on the contrary, when the case has been slow and rather irregular, we may expect to meet with the evidences of tubercular deposit, as well in the brain and membranes as in other parts of the body.

To the minute researches of the French pathologists we are indebted for the knowledge we possess of the early appearance of tubercular deposits in the membranes of the brain. They occur as "minute, flattened, spherical bodies, of the size of a small pin's head, or smaller, and either of a yellowish colour and rather friable under pressure, or greyish, semi-transparent, and resistant, almost exactly resembling the grey granulations which are sometimes seen in the lungs or pleuræ of phthisical subjects."

They are also met with in an earlier stage, when they look like small opaque spots, communicating no perceptible roughness to the membranes. This appearance is observed in the arachnoid, covering the cerebellum and base of the brain. The fine grey bodies are mostly seen about the front, or imbedded in the pia mater, in the neighbourhood of the optic nerves.

The surface of the brain generally presents but

trifling appearance of disease, though sometimes the convolutions are flattened and the sulci partially obliterated, by the pressure of fluid contained in the ventricles.

The appearances observed when the case has been acute, and inflammation has been decidedly present, are somewhat different. The vessels of the membranes will be found full and turgid. There is generally considerable vascularity of the pia mater; slight thickening and dullness of colour, or opacity of the arachnoid membrane, are also observed, with a dryness of that membrane, and occasionally an effusion of serum between the membranes. Lymph is also found around the vessels, and between the sulci. These changes are most apparent in the base of the brain.

When we come to cut into the substance of the brain itself, we may find it very little altered from the natural appearance. The ventricles usually contain serum, varying from two to six ounces in quantity. The cerebral substance around the ventricles is often much softened, and breaks down very readily. Dr. West describes it as having the appearance of having been "soaked in serum." The quantity of fluid found in the ventricles is very variable; sometimes we find least where most had been expected, and *vice versa*; occasionally the quantity is so large, that there would seem to have been a considerable absorption

of cerebral substance. In one case, where there had been considerable pain in the left side and back of the head, I found the choroid plexus, occupying the inferior cornu of the lateral ventricle of that side, enlarged, and much more vascular than the corresponding one of the other side. The cerebral substance in this case, also, appeared, when cut into, dotted with bloody points, and this, too, chiefly at the left side.

The organs in which tubercles are most frequently found, at the same time, are the lungs, bronchial glands, the spleen, liver, mesenteric glands, and intestines. "Tubercular ulceration of the intestines," Dr. West says, "may give rise to diarrhœa ; hence, constipation may not be an invariable symptom of hydrocephalus."

A morbid condition of the liver and intestinal mucous membrane has also been observed by Dr. Cheyne. He found "the intestines inflamed and constricted, as from spasms, and the surface of the liver of a bright red colour, abounding in minute vessels, and sometimes extensively adhering to the peritoneum." In many dissections, also, he found the surface of the liver studded with small white tubercles, not larger than grains of mustard. In every examination I have had an opportunity of making, or assisting at, more or less distinct evidence was seen of the above pathological changes in the abdomen.

Treatment.—Although tubercular meningitis be not a disease so rapid in its progress, and so speedily destructive of life, as the acute form, nevertheless time cannot be wasted or lost with impunity, and the issue of the case will often depend upon the promptness and efficiency of our treatment. These remarks apply more particularly to those cases presenting acute inflammatory symptoms, and running a rapid course. The other class of cases, those which commence insidiously, and whose progress is slow, afford a greater opportunity for treatment, though in the main they are not more fortunate in the result. This may be accounted for, partly, by the fact of the disease having oft times made much progress before our attention has been directed to it, and its real nature been discovered, and in part, owing to the circumstance that these slow cases are those in which tubercular deposits exist to the greatest extent, and in which other scrofulous changes have taken place. Hence our usual antiphlogistic means, bleeding, mercury, &c., are less admissible, and less likely to be successful.

If the diagnosis of tubercular meningitis be occasionally difficult and obscure, we have the highest authorities agreeing that less harm generally can arise from supposing the disease to be present, and acting accordingly, than from overlooking it entirely and remaining inactive. The

means also to be employed in the earliest stages of real disease, are those which would be most applicable to, and most likely to remove, functional disorder. I would wish, especially, to caution my readers against a practice too timid and hesitating, while doubt exists of the real nature of the case ; in other words, against a too expectant plan, or that of treating symptoms as merely functional, or arising from some cause unconnected with the state of the brain itself, until, perhaps, fatal mischief has been done, and hydrocephalus declares itself in its most unquestionable shape.

It is almost unnecessary to add, that our treatment and general management of each case must, in a great measure, depend upon, and be influenced by the age, constitution, and temperament of the child. Means loudly called for, and whose use would be imperative in some cases, are unnecessary, and may prove injurious in others. Hence the necessity of avoiding mere routine practice.

When called upon to visit a child supposed to be labouring under symptoms of cerebral disease, having made all necessary inquiries, our earliest attention should be directed to the state of the abdomen and alimentary canal. The operation of the first purgative given will afford useful information, as well in exhibiting the nature and appearance of the stools obtained, (generally so characteristic in hydrocephalus,) as in enabling us

to judge of the state of torpor or activity of the "primæ viæ;" and also the effects of the medicine upon the general symptoms. Some of these will at once yield after the operation of an aperient, affording grounds for considerable hope as to the issue of the case.

I almost always commence the treatment of a suspected case by giving an emetic, generally of ipecacuanha or tartar-emetic. This is, I am aware, considered by many, bold and even hazardous practice, where the head is believed to be engaged; but I can vouch for the perfect safety and great success of it. I have given the emetic very early when the case came under my observation, and again later when admissible, and never had I reason to be sorry for so doing, but more than once regretted not having acted similarly. Gastric derangement and vomiting are very frequently present. The first is generally benefitted by the free action of the emetic; and the vomiting, also, even when dependent upon the state of the brain, has been checked for some time, giving opportunity for medicine to be retained upon the stomach. Tartar-emetic I generally prefer in the early stages, unless decidedly contra-indicated by great debility, or some peculiar state of the stomach itself. It certainly possesses a generally sedative and tranquillizing effect, and has often appeared to be most beneficial in lowering and equalizing the

circulation, and unloading the vessels of the brain, &c.

Although the free use of purgative medicines is very generally sanctioned, too much may be said in behalf of their employment. I cannot go the length of recommending "that the bowels be kept acting for several days, two, three, or four times a day, by means of some powerfully cathartic medicine." I would use this valuable class of medicines more sparingly. We must recollect that keeping the digestive apparatus in such a continued state of irritation must rapidly exhaust the strength, and we know that danger follows great debility. Let the frequency of the repetition of the purgative depend upon the necessity which may exist for it, such being judged of by the effect upon the symptoms generally, and by the appearance of the evacuations obtained. Purgatives will be more required when the stools are foetid and abundant, than when they are scanty, and consist merely of shreddy mucus mixed with bile. I have seen mischief done by the too free use of drastic cathartics, scammony, gamboge, &c.

A combination of jalap and calomel at first, followed by rhubarb with a mercurial, (calomel, or hydrargyrum cum magnesia) and these carried off by an aperient draught, with senna, &c., will generally be found active enough for very young children. Cases accompanied by great constipation may occur,

requiring stronger medicines, but those mentioned will generally be sufficient. The frequency of the repetition must, of course, be determined by the circumstances above alluded to. Senna may be easily given to children in a very tasteless form, by mixing the infusion with an equal quantity of strong coffee, and sweetening as usual. When practicable, I always prescribe a purgative enema before the administration of medicine by the mouth ; it will relieve the lower bowels, rendering the action of an aperient more certain and less painful. When very great irritability of the stomach exists, a drop or half a drop of Short's croton oil, placed upon the tongue, will often effectually evacuate the bowels, at the same time lessening the nausea. In such cases, Dr. Cheyne recommends "a drachm or two of magnesia, saturated with lemon-juice, and given every second or third hour."

In every case occurring at those periods when we might suspect the process of dentition to be going on, we should examine the state of the gums, and even though a tooth may not be felt forward enough to seem to require interference, I would never hesitate to scarify them ; it removes a source of irritation, and in these cases we should leave nothing undone. Many times I have seen sound sleep follow such practice, and convulsions, which had been constantly present, disappear. It is a

mistaken notion to suppose that early scarification of the gums makes the subsequent cutting of the teeth more difficult.

Another very necessary and useful point to receive attention now is, having the head frequently sponged with cold water, and kept perfectly cool. If the child's caps have not been already discarded, seize this opportunity of laying them aside. The greatest benefit may be derived from, and great comfort bestowed upon, an infant, even when suffering from the irritation of ordinary teething, by this sponging for a few minutes at a time. I have constantly ordered its repetition several times in the day, and had it done under my own observation hourly, with the most marked relief to the little sufferer.

These evacuations and other means premised, we may now consider the propriety of abstracting blood from the system.

In strong children, or those in whom the inflammatory symptoms run high, blood-letting, local in general, may be safely practised, and will prove a most valuable antecedent and auxiliary in carrying out the purgative plan of treatment. But "the physician who recommends very free blood-letting in all cases, and he who, considering hydrocephalus as a passive dropsy, or disease purely of debility, altogether proscribes bleeding, are equally mistaken in their practice." Leeches may, in most cases, be

applied to the head with advantage, the number being varied according to the age of the child and the severity of the pain. This latter, also, and its continuance, must determine the necessity for their repetition. The situation at which leeches should be applied forms a point of difference between authors. As a general rule, they may be put as near to the seat of the greatest pain as possible, viz. to the temples, when the forehead is most complained of, and to the mastoid process, when the pain is at the back of the head or towards one side. This situation has been objected to for their application, as affording an opportunity for the child rubbing them off against the pillow ; but the free communication here with the lateral sinuses, points it out as a situation peculiarly fitted for relieving the overloaded vessels, and the liability to the leeches being rubbed off may be obviated by keeping the child in the nurse's arms during the process. I have seen very good effects from the application of leeches to the inner canthus of the orbit, and more than once I have applied them myself to the Schneiderian membrane, with very marked relief. Whilst upon this subject, we may mention that Dr. Cheyne recommends the application of leeches to the region of the liver, to prepare the way for, and co-operate with, medicines calculated to act upon that viscus. We find, also, in Maunsell and Evan-son, that " when the hydrocephalic symptoms

occur, during the existence of disease of the lungs, or particularly of the digestive organs, the application of leeches over the seat of the original disorder will often more effectually relieve the head, than if they were applied directly thereto."

Bleeding from the arm may possibly be required in some very acute cases, approaching, in severity and rapidity of course, to the character of acute meningitis. Such necessity must be determined by the experience of the practitioner.

We have already spoken of mercury, and its utility as an ingredient of our early purgatives; we now recommend its further use, as a medicine upon which we must place considerable reliance in the treatment of hydrocephalus. I do not mean to say that we shall observe such good effects from it in this affection, as in some other inflammatory diseases; but still I have so frequently seen benefit follow its administration, that I think it deserves a foremost place amongst our means of cure. I would not recommend its very free or speedy introduction, for though salivation may not be possible in the child under three years, still harm may arise, and fatal exhaustion be produced. If the case be very acute, we may give it more freely; but the gradual continued use of it, in moderate doses, so as to affect the system, is what I recommend. To prevent undue action upon the bowels, we must combine it with opium. The

fears entertained by many of the use of opium in cerebral affections are sometimes overstrained. It is a most valuable assistant, and, with reasonable circumspection, cannot do harm.

The forms in which I generally prescribe these medicines are, calomel with opium, in very acute cases ; and, more frequently, hydrargyrum cum magnesia, with Dover's powder and James's powder. I must speak in the highest terms of hydrargyrum cum creta or magnesia, with ipecacuanha, as an alterative, not only in this, but in many other diseases of children. It seems to possess peculiar powers in restoring the healthy secretions of the mucous membrane of portions of the alimentary canal, and generally acts gently, also, upon the skin.

As constipation so constantly attends the early and advanced stages of hydrocephalus, we must be prepared with means to overcome it. The frequent use of enemata is unobjectionable, and the occasional addition of a few grains of rhubarb to some of the powders above mentioned, followed by a draught of infusion of senna, with a little tincture of the same, and electuary of scammony, will be generally found sufficient for that purpose.

Counter-irritants.—It is a question how soon we should commence the use of these remedies. Some advocate early shaving of the head, and blistering all over, or exciting irritation by a croton-oil lini-

ment ; others prefer the application of blisters to the nape, or sinapisms to the feet and legs. I have never had reason to regret the early application of a blister to the neck, and have frequently seen much benefit from its repetition, and the surface being kept open. For this purpose, mercurial ointment with savine may be used, and we also gain the advantage of assisting in bringing the constitution under the mercurial influence. The biniodide of mercury, used in the form of ointment, as a counter-irritant, also possesses some advantages.*

Fomentations.—We must not persevere with the use of cold applications when coma threatens. I have seen great comfort seemingly given to the little sufferer, and sound sleep sometimes induced, by stuping the soles and feet in the manner before mentioned. Stupes to the abdomen, also, are very beneficial in allaying irritation, and promoting the healthy action of the bowels. Sponging the entire surface with tepid water ought not to be omitted ; it comforts the child, and predisposes to perspiration.

* As a topical remedy in the form of ointment, the biniodide of mercury is applied with benefit to chronic glandular enlargements ; its use, however, requires much caution, especially when applied to raw surfaces. The ointment, as ordered by the "London Pharmacopœia," (biniodide of mercury, an ounce ; white wax, two ounces ; lard, six ounces,) is much too strong for ordinary use, and should be further diluted with three or four times its weight of lard.—*Neligan on Medicines*, p. 311.

Iodine.—Of late years, the use of iodine in the treatment of hydrocephalus has numerous advocates, as well in this country as on the continent. Many, indeed, recommend its use, almost to the exclusion of mercury. Certain it is that we cannot claim for mercury the same specific control over hydrocephalus, that it possesses in some other inflammations. We know that iodine does often beneficially modify scrofulous disease ; its use, then, in these cases, occurring so frequently in decidedly scrofulous patients, seems very reasonable, and has, moreover, the prestige of great names to recommend it. I have tried it, but cannot speak very decidedly of any success fairly attributable to its use. Iodine, in combination with mercury, was some time since recommended in consultation by a friend of mine, in a case which was under my care ; the form used was hydriodate of potash in solution, with corrosive sublimate made into small pills with crumb of bread. This, which was a tedious case, in a very scrofulous child, did remarkably well.

The biniodide of mercury is recommended by Maunsell and Evanson, as combining the good effects of both medicines.

During the employment of the means above enumerated, care must be taken to support the strength sufficiently, by giving good nutritious food. Broth, jelly, arrowroot, light puddings,

must also be given ; and when the stomach continues very irritable, enemata of broth will be found useful. Stimulants may occasionally be required, but must, of course, be given with great caution. Camphor mixture, with aromatic spirit of ammonia, will often allay vomiting, and rouse the system ; even when coma has set in, such stimulants have acted most beneficially ; and I have seen very good effects produced by a dose of croton oil. I once sat by the bed of a child, who, to all appearance, was sinking under the effects of hydrocephalus. There had been a gradual loss of vision, and stertor and difficult breathing seemed to indicate the supervention of coma. A blister to the nape which vespicated well, and a dose of croton oil which acted freely, were the means which seemed to arrest the morbid action. The boy ultimately recovered.

When the urine is scanty, which is very often the case, some authors recommend the use of squill and digitalis. I have not any personal acquaintance with their effects in those cases, having found other means sufficient ; but I would say that digitalis is not an easily managed medicine with children.

Prophylaxis.—This appears to be the place in which to make a few remarks as to the prophylactic means to be used, when we are apprehensive of an

attack of hydrocephalus in a child. Dr. West remarks, that to be successful, "we must treat the threatenings of this disease." I have watched such cases with more than ordinary care and anxiety. Where the predisposition is strong, every affection to which childhood is liable seems to be accompanied with symptoms of the malady, and they require the closest observation, and often the nicest management. Our directions cannot, of course, be other than general.

The state of the stomach and bowels should be particularly attended to. Children are prone to over-eat, and parents to give them too much. Many of their maladies arise from this cause, as case upon case could be quoted to prove. Children should not have meat nearly so often as the generality of those in the upper and middle ranks are given it. The frequency should, in some respects, depend upon the opportunities they have for exercise, and being in the open air. Two, or even three, days abstinence in the week from solid meat, would do much to preserve health, and prevent the necessity for those frequent powders so much in use. If this be thought "*diète absolue*," let them have broth on one of the abstaining days. When weather and other circumstances permit, children should spend many hours daily in the open air; even when the weather is cold, they will often enjoy being out of doors, if sufficiently

clothed ; and here I must enter a protest against the modern fashion of only half clothing children. I would rather my child wanted a meal, than see it subjected to that daily starvation from cold, to which those poor little fashionables, who trudge along with measured step, are exposed, as to their lower limbs especially.

Too little attention is generally paid to regularity of hours for giving children their meals ; when practicable, an early dinner hour should be fixed on for them. Nothing requires more care than their sleeping apartment. Enter an ordinary nursery between eight o'clock at night and the same hour in the morning. If the occupants be numerous, you find it generally very close and ill-ventilated,—every child's bed, perhaps, furnished with its own nice curtain, and placed in the closest corner that can be selected. Here they spend half their entire time, hour after hour, inhaling a vitiated atmosphere, and slowly sowing the seeds of future disease. Let the room door be left open at night, and have a ventilator placed high up near the ceiling, opening into the flue ; a hole broken will answer every purpose. Let curtains be banished from the nursery, and all useless furniture removed, and at times that the children are absent, let the windows be opened for thorough ventilation. In addition, let daily ablution be practised with every child : it keeps the skin in a healthy

state, and very much lessens the liability to disease.

Where the tendency to hydrocephalus exhibits itself very strongly, either in a constitution hereditarily delicate or acquired, I would recommend the formation of an issue in the arm ; and where the disease has been unequivocally present, I have seen the best effects follow an issue established at the top of the head.

CHRONIC HYDROCEPHALUS.

We cannot conclude our notice of the affections of the cerebrum in infancy and childhood, without giving a short account of dropsy of the brain, as it has been called, or chronic hydrocephalus. It is a condition of the organ not by any means so frequently met with as the acute form, and is most generally congenital, or arises very soon after birth. Many authors consider that it almost always depends upon malformation of the brain.

In some cases it may, indeed, be looked upon as a mere passive dropsy, whilst in others, and these the most numerous, we must regard it as the result of a low inflammatory condition, which may have existed for a lengthened period, and even before birth.

A child may be apparently born healthy, and for the first few weeks or months not attract any

particular attention. The earliest symptoms which we notice of incipient disease are, generally, a wasting of flesh, and a want of thriving appearance. The child loses its plumpness, and becomes soft ; and this, although the appetite may be good : sometimes the appetite is even craving, and there is a disordered condition of the bowels ; they are constipated, or irregularly free. Convulsions may take place very early and frequently, and cannot be traced to any particular cause. A rolling of the head and eyes, and perhaps strabismus, may exist ; and then, soon, an enlargement of the head will be noticed. This increases very gradually, but continuously, and is accompanied with tension of the fontanelles, and fullness of the veins of the forehead and temples. The head becomes so large and heavy, that the child is unable to support the weight of it, and it hangs to one side. In the very young child, the enlargement of the head proceeds rapidly, and to a great extent, from the ready yielding of the parietes. The disease is almost invariably fatal. Some cases are considerably protracted, and a life of misery is terminated by convulsions, or seeming exhaustion. Occasionally, acute inflammation sets in, and proves the immediate cause of dissolution.

Dissection shows, that in some cases the fluid is contained in the sac of the arachnoid, constituting what is termed external hydrocephalus, whilst in

the vast majority of cases, the lateral ventricles form the seat of the collection. The quantity of this fluid varies, of course, with the persistence of the disease, and the size the head may have attained. Sometimes it presents the appearance of pure limpid serum ; at others, especially when symptoms of inflammation have been present long before death, it appears turbid, with flocculi of lymph in it.

The lining membrane of the ventricles becomes changed. Dr. West says :—"Even when no false membrane is formed within the ventricles, their lining often presents other evidence, besides mere thickening, of its having been the seat of inflammation : it is roughened and granular, presenting an appearance closely resembling shagreen, and communicating a very perceptible roughness to the finger. All parts do not seem equally liable to undergo this change ; but I have observed it to be much more marked about the corpora striata than elsewhere."

Regarding the mode of treatment, very little can be said in favor of the success of any particular plan. Some cases are decidedly and hopelessly incurable. In these, very frequently recurring convulsions and paralysis will be present. Those in which there is some likelihood of cure, are characterized by simple enlargement of the head, without much convulsive action.

Gölis recommends " that the hair be kept closely cut, and that one or two drachms of mild mercurial ointment be rubbed daily into the scalp ; at the same time from a quarter to half a grain of calomel should be given twice a-day, unless diarrhœa come on, when the inunction alone must be performed."

Blisters to the nape, occasional leeching, if there be much heat of head, and the administration of a purgative now and then, seem to be the chief means upon which any reliance can be placed. A couple of small issues in the back of the neck may also be of service, by keeping up a long-continued drain.

Mr. Barnard, of Bath, has recommended, and spoken highly of the success attending a mode of bandaging the head, so as to cause pressure upon the parietes of the cranium, and prevent their further expansion.

Puncture of the cranium, and evacuation of the fluid collected, have also been practised. The extreme difficulty of determining, with any degree of accuracy, the situation of this fluid, whether within the ventricles or external to them, must form an insuperable objection to the adoption of this means ; and unfortunately, the recorded results of cases thus treated do not justify its general recommendation.

On the whole, chronic hydrocephalus is one of that class of diseases, which it is so very painful to the physician to be occasionally obliged to witness

through their various stages. He can scarcely either give or indulge in hope of a favourable termination, and sometimes, even when apparant recovery may take place, the intellect will remain in a permanently weakened condition.

We must here conclude our sketch of the principal "CEREBRAL AFFECTIONS OF INFANCY." It is necessarily brief, and, we fear, may be thought imperfect in some particulars; but it did not aim at the character of a complete work—it was only an essay. Most attention was bestowed upon those affections which occur with the greatest frequency, and on this account, the subject of "WATER ON THE BRAIN" claimed considerable space.

If any useful hints have been given, either as to the prevention of this disease, or its treatment when established, the author will feel much gratified.

He would again, before taking leave, beg to remind parents and those who have the charge of children, that they have much in their own power. Let them avoid those causes which have been alluded to as predisposing, and a sound constitution and vigorous understanding will often take the place of delicate physical and weakened intellectual developement.

"The fabric of the human mind is curious and wonderful as well as that of the human body. The faculties of the one are with no less wisdom

adapted to their several ends than the organs of the other ; and the better we are acquainted with their nature and uses, their defects and disorders, the more skilfully, and with the greater success, shall we apply the resources of the healing art to their treatment."

THE END.

